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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,833	06/25/2001	Steven Verhaverbeke	004730	2675
32588	7590	11/26/2004		
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			EXAMINER JOLLEY, KIRSTEN	
			ART UNIT 1762	PAPER NUMBER

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,833

Applicant(s)

VERHAVERBEKE ET AL.

Examiner

Kirsten C Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 17 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 8-13 is/are allowed.
6) ☒ Claim(s) 1-7 and 17 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/23/04
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. The claim objections set forth in the prior Office action have been withdrawn in response to Applicant's amendments.
2. Applicant's arguments filed August 23, 2004 have been fully considered but they are not persuasive.

With respect to the 35 USC 102(b) rejections of claims 1 and 3 over McConnell et al., Applicant argues that, in McConnell et al., the chemical is measured by the metering pump 44 (not the tank 32) because McConnell et al. indicates that the metering pump is provided "for withdrawing metered amount of fluid from the tank." The Examiner agrees that measuring tank 32 is not filled to its entire known volume with a single chemical. However, the Examiner also noted an alternative teaching in McConnell et al. with respect to special fluids such as HF comprising two consecutive 3-port valves (Figure 5 and col. 12, lines 9-62). This system accurately controls the amount of HF that is injected into a water flow stream in order to deliver precise concentrations of HF to the semiconductor cleaning process. The valve system of Figure 5 has a tube of known volume (the tube connecting the two 3-port valves), the tube is filled with a chemical to generate a measured amount of chemical equal to the known volume of the tube, and then applies the measured amount of chemical to a semiconductor wafer in a single wafer cleaning process. While the amount of chemical applied is greater than just the amount contained within the tube of the valve system, the amount in the tube is never-the-less a known, measured amount and is applied to the wafer during a cleaning process. With respect to claims 4

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and 17, McConnell et al. additionally teaches (with regard to Figure 5) flowing DI water into the valve system to push the measured amount of said chemical into a chamber with said DI water, and continuing to flow said DI water into said chamber until a predetermined level/concentration are reached in the chamber to form a mixed solution.

3. The claim rejections of claims 8-10 over McConnell et al. have been withdrawn in response to amendment requiring that the DI water flows into the tube to push the measured amount of chemical into a third conduit, and also because McConnell et al. does not teach combining the flow of the measured amount of chemical and DI water in the third conduit with a flow of DI water in a second conduit as argued by Applicant. (While Applicant argues that the metering pump 148 generates the measured amount of chemical, it is noted that this is irrelevant. The claims merely require that a tube of known volume is filled with a chemical; the claims do not exclude use of a metering pump to fill the tube, or to continue filling the tube.)

4. A new rejection of claim 1 is made over the newly-cited prior art of Ryu, supplied in the Information Disclosure Statement of August 23, 2004.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless,—

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3-4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by McConnell et al. (US 4,899,767).

McConnell et al. also teaches a delivery system for special fluids such as HF comprising two consecutive 3-port valves to accurately control the amount of HF that is injected into a water flow stream in order deliver precise concentrations of HF to the semiconductor cleaning process (Figure 5 and col. 12, lines 9-62). This valve system of Figure 5 necessarily has a known volume, and the described process comprises the steps of filling the tube with a cleaning chemical to generate a measured amount of said chemical and applying the measured amount to a semiconductor wafer in a single semiconductor wafer cleaning process.

With respect to claims 4 and 7, McConnell et al. additionally teaches the steps of flowing DI water into said valve system and pushing the measured amount of chemical into a chamber with said DI water, and continuing to flow said DI water (and chemical) into said chamber until a predetermined level is reached in said chamber.

McConnell et al. teaches that its process may be used with *one* or more semiconductor wafers in col. 13, lines 56-57, therefore McConnell et al. discloses a single semiconductor wafer cleaning process.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ryu (US 5,346,302).

Ryu discloses a method of generating a measured amount of a chemical in a semiconductor wafer cleaning process (see Background in col. 1) comprising: flowing a chemical into a valve system having a tube of a known volume (dispensing container 1a); filling said tube with said known volume with said chemical wherein filling the tube generates a measured amount of chemical approximately equal to the known volume of the tube (col. 3, lines 5-33); and applying said measured amount of said chemical to a semiconductor wafer cleaning process (also see col. 5). Ryu merely lacks a teaching that the measured amount of chemical (HF) is applied to a *single* semiconductor wafer. It would have been obvious to one having ordinary skill in the art to have applied the mixed HF solution of Ryu to a single semiconductor wafer with the expectation of successful results since Ryu is silent as to whether a single wafer or a plurality of wafers are treated simultaneously, and because it is well known in the semiconductor wafer cleaning art to clean wafers one at a time.

9. Claims 2, 5-6, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over McConnell et al.

As to claims 2 and 6, McConnell et al. lacks a teaching of the use of a 6-port valve in its valve system. McConnell et al. states in col. 6, lines 59-65 that "various multiport two- or three-position valves may be substituted in the loop for certain groups of two or more valves shown in the figures." McConnell et al. also states with regard to Figure 5, "a five port, four way valve may also be used in place of the two three port, 2 position valves" (col. 12, lines 44-46). Therefore, McConnell et al. suggests the replacement of numerous smaller valves with multi-port valves. It would have been obvious to have replaced two 3-port valves of McConnell et al. with

a 6-port valve with the expectation of equivalent results since it is known that a 6-port valve may perform the same as two 3-port valve in succession.

Claims 5 and 17 lack a teaching of applying the mixed chemical solution to a spinning wafer. McConnell et al. teaches a desire to provide uniform exposure of the wafer(s) treated to the cleaning solution in the process of its invention. It is well known in the semiconductor manufacturing art that spinning of wafers immersed in a treatment solution ensures that all areas of the semiconductor wafer are exposed equally to the treatment solution. It would have been obvious for one having ordinary skill in the art to have spun the semiconductor wafer(s) while immersed in the various cleaning solutions in McConnell et al.'s process in order to equally expose all areas of the wafer(s).

Allowable Subject Matter

10. Claims 8-13 are allowed. Claims 8-10 are allowable for the reasons discussed above in section 3. Claims 11-13 are allowable for the reasons discussed in section 11 of the Office action mailed May 20, 2004.

Conclusion

11. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on August 23, 2004 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kirsten C Jolley
Primary Examiner
Art Unit 1762

KCJ